Kendall Station

Wednesday, May 11, 2016 10:55 AM

Original AO (11-005) issued Jan 31, 2011
Modification issued Oct 16, 2014

2016-05-11: Email from George Harding

- Veolia would like to meet regarding the construction schedule and interim limits for the Kendal Green power plant in Cambridge.
- As part of resolution of a permit appeal we issued an AO putting the plant on a schedule to remove its thermal discharge from the Charles by selling excess steam for heating and installing an air-cooled condenser system. The schedule was originally tied to reconstruction of the Longfellow Bridge (the steam line was to be hung under the bridge); under the original schedule they would not have been required to complete any construction yet. To speed the process the plant owners (who have changed several times over the course of our story) constructed a steam line crossing the Charles by the Museum of Science. This removed some heat form the river and started the clock running on the rest of the schedule. In the fall of 2014 Veolia (the latest owner) requested a schedule extension to evaluate a modification to the air cooling system that would allow the plant to utilize more of the waste energy for generation. After several months of study they found that site conditions (buried hazardous waste and an iffy seawall threatening to collapse into the Broad Canal) rendered the modification infeasible, so they went back to the original plan. Late in 2015 one of the boilers at the plant ruptured, spreading asbestos throughout the generator building. This caused construction delays during the asbestos cleanup, and the need for reconstruction of the boiler. They also sent out the generators for inspection and rehabilitation by the manufacturer. They requested another schedule after the rupture; I suggested waiting until the results of the generator inspection came back and they knew how long the rehab would take so we wouldn't be faced with an another extension request. The original schedule extension called for work to be completed and the cooling water discharge to cease by June 2016. The additional delays and equipment shakedown will push that back until late summer. As noted above, this is still years ahead of when the thermal discharge would be eliminated under the original scheme. Veolia's contractor has been working diligently on a difficult site (extremely tight, working around an operating power plant without disrupting operation).

2016-06-27: Email from George 6/26/16

- Spoke with Bill Fahey from Veolia regarding a meeting.
- Regarding the verbal OK, in late 2014 we had modified the schedule previously to allow Veolia the opportunity to look at the feasibility of a more efficient air-cooling system. This required drilling test holes – the work was slowed by the winter of 2015. Then last fall a boiler ruptured, spreading asbestos throughout the building. The asbestos cleanup and repair of the boiler further delayed the project. Currently installation of the new equipment is completed, and Veolia is beginning the shakedown and testing phase – they will put as much heat as possible into the air, but they will have some thermal discharges to the river. They expect to complete this and fully eliminate the thermal discharge by October. They are looking for another order modification to cover any discharges this summer. I forget whether the order has a force majeure clause, but I think their delays would fit into that category. And keep in mind that if they had continued under the original schedule tied to the Longfellow Bridge reconstruction they would not have begun the plant modifications yet.

Basically they want a modification until Oct 2016 to stop discharging any heat to River

2016-06-29: Meeting here at R1 offices with: Fahey, Mahoney, McBurney, Caldwell

- Want extension to Oct 1st.
- They talked to Zimmerman at Charles River Watershed
  - He didn't have a problem with it
- We agreed George will work on letter right away

2016-07-01: George drafts Extension at:
K:\Working Folders\MA\Cambridge\Veolia Kendall Cogeneration Station\AO Mod6-29-16draft.doc

2016-07-01: I sent comments back to George

2016-07-06: George sent me Exec. Summary at:
K:\Working Folders\MA\Cambridge\Veolia Kendall Cogeneration Station\AO mod exec summary 7-6-16.doc

- I told him no comments-- send it out

2016-07-08: JK sends blurb to Bill Chin

On July 7, 2016 the Region modified a compliance schedule for Kendall Green Energy LLC ("Kendall Green") to greatly reduce its thermal discharge to the Charles River Lower Basin. Kendall Green is an electric generating station located near Kendall Square in Cambridge, and withdraws and discharges water from the Charles River for cooling. The cooling water discharge has a significant impact on the river during summer months. Kendall Green was under order to construct a new steam line across the Charles River and install a Back Pressure Steam Turbine and Air Cooled Condenser to reduce thermal discharges to the river. This modified schedule greatly shortened the time frame by which Kendall Green reduces its thermal discharges to Charles River and is able to fully comply with its NPDES permit limits. (Contacts: Technical, George Harding (617-918-1870; Legal, Jeff Kopf (617-918-1796))

2016-07-11: Extension letter sent out extending compliance deadline to Oct 1, 2016.

2016-09-30: Email from Kendall:

I left you a voice mail on Monday and today to provide you with an update on Kendall. Over the past 6 weeks we have been going through the start-up and commissioning of the Back Pressure Steam Turbine (BPST) and high pressure Air Cooled Condenser (ACC). Like most start-ups

this one has come with some challenges, which is something we talked about during our last meeting at your offices. I wanted to make you aware of the issues that we are dealing with at this point. The challenges are as follows:

- We have elevated silica levels in the condensate exiting the new ACC unit. The levels have been running in the range of 15 ppb to upwards of 60 ppb. The unit must achieve a consistent reading of less than 20 ppb to be able to be used as boiler feed (per the design requirements). Our contractor hydrolazed the ACC and the levels dropped slightly but could not yet meet the design standard. We have shipped to the site a polishing unit that will be added temporarily to the back end of the ACC. The polishing unit is made up of 6 fin fan coolers, 3 120 ton air handling units, 2 300 kW generators, and a portable demineralizer. This unit is on site and being assembled.
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- When we introduced the steam into the ACC unit the thermal expansion caused the unit to distort, and we experienced a noticeable deflection in most of the 24- 6 inch expansion joints that feed the ACC. I have attached a picture of the deflection in the joints. When we saw the deflection in the joints we stopped steam flow immediately. Our contractor is looking at engineered solutions to fix this expansion issue. These solutions include adding offset spacers, modifying the type of joint, and replacing the joints with hard piped expansion loops. We are told by our Contractor that its design engineer and various vendors have stated that the system is safe to run, but we are waiting for additional verification, and written confirmation, before we operate.

In accordance with Article VI section 12 of the administrative order I want to notify you that we may miss our obligation to stop recirculation water on October 1, a requirement of the Administrative Order. We'd like to work with you to better understand what we can do as we work our way through these issues. We will need to operate steam turbine #1 and #2 and recirculate cooling water until we can be satisfied that the new system meets all requirements, including, of course, safety. The safety of our employees is our highest priority.

At this point, we respectfully request a week to week extension, with no less than weekly updates provided by me. We are confident that we are close to completion, but additional time to address these matters that exceeded our ability to control are necessary. If you would like to discuss in more detail, please do not hesitate to contact me at 617 794-7616.

Bill Fahey
Senior Vice President-Technical and Performance
VEOLIA NORTH AMERICA

2016-09-30: Email from George H.

- Spoke with Bill Fahey late this afternoon regarding the latest issues with the Kendall Green startup.
- The first item mentioned in his e-mail, the high silica levels, should be resolved shortly. The high levels are due to manufacturing residue on the piping in the ACC Bill said they have crews working round the clock to complete the hookup of the portable demineralizer. Once that is in place the silica level in the condensate should drop; once the residue is flushed from the system the issue should disappear.
- The second item, distortion of the expansion joints, is delaying testing of the ACC units. Bill said specialist engineers are due to visit the facility tomorrow to assess the safety of the system and recommend corrective actions. Veolia is pressuring the construction contractor to correct the problem ASAP.
- Once the fix is made the ACC units will still need to be tested and commissioned; during this process the plant will still need to use some recirculation water, so Veolia will not meet the October 1 date to cease discharge. Although the demand for steam from the facility hasn't ramped up to winter levels, they are the sole source for Mass General.
- I told Bill I don't have the authority to grant the requested week-to-week schedule extension, and that it will be sometime next week before we can provide any kind of formal response. I'm out of the office tomorrow (Friday), but told him to leave me a message regarding what the experts recommend and what plant operations may occur over the weekend and I'll check back in with him Monday.

2016-10-11: Email from GH

- He called me last Monday – they opted to curtail operations over the weekend and shut down the cooling water pumps. To design a fix for the expansion joints they need to bring the system up to operating pressure and temperature and measure the distortion, but Veoila was concerned that if a joint failed while being measured there could be serious injuries or deaths. The experts brought in by the manufacturer and contractor concluded the risk of rupture was negligible, so the plan was to ramp up the system and make the necessary measurements; waste heat would be vented to the atmosphere rather than going to the river. I expect I'll get a progress report sometime this week. As of now we don't need another written extension.